REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-24 are presently active in this case. No claim amendments are presented, thus, no new matter is added.

In the outstanding Office Action, Claims 1-6, 8-9, 12-15, and 23-24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Flamm et al. (U.S. Patent No. 5,711,849, hereafter "Flamm") in view of Gerrish (U.S. Patent No. 5,770,922); Claims 1-5, 10-15, and 23-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Farber et al. (U.S. Patent No. 6,232,134, hereafter "Farber") in view of Gerrish; Claims 7 and 10-11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Flamm in view of Gerrish and Angell et al. (U.S. Patent No. 5,658,423, hereafter "Angell"); and Claims 16-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Flamm in view of Gerrish and to Scott et al. (U.S. Patent No. 5,601,869, hereafter "Scott").

Applicants wish to thank Examiner Berman for the courtesy of an interview with Applicants' representative, Mr. Sameer Gokhale, on May 15, 2009. During the interview, Mr. Gokhale explained the differences between the Applicants' invention and the applied art. Mr. Gokhale presented arguments against the obviousness of Claims 1 and 14 with respect to the combinations of Farber and Gerrish, and Flamm and Gerrish. Mr. Gokhale also presented arguments with respect to the rejections of Claims 23 and 24. Arguments similar to those presented during the interview are presented below for formal consideration.

With respect to the rejection of Claim 1 under 35 U.S.C. §103(a), with Flamm as the primary reference, Applicants respectfully traverse this ground of rejection. Claim 1 recites, *inter alia*,

> characterizing a process, said characterizing comprising measuring a process performance parameter at a plurality of positions on a sample and transforming the measurement data into at least one spatial component in spectral space to identify a measured signature of said process, wherein said measured signature comprises the at least one spatial component in spectral space;
>
> optimizing said process, said optimizing comprising identifying a reference signature of said process; and
>
> comparing said measured signature of said process with said reference signature for said process, wherein said comparing comprises determining a difference signature representing a difference between the measured signature and reference signature, and determining a process fault by comparing said difference signature with a threshold, wherein said process fault occurs when said threshold is exceeded.

Flamm is directed to a method of selecting appropriate etching parameters in a plasma etching process. Flamm describes a method of designing a reactor by chemically etching a top film surface to define a top surface film 27 as shown in Figure 1A. The top surface film includes an etching profile which occurs by way of different etch rates along a direction of the film (see col. 4, lines 4-6; and col. 5, lines 44-47 of Flamm). Fig. 3 shows a process in which an etching profile is analyzed to optimize etching parameters (see col. 5, lines 16-61).

The Office Action acknowledges that Flamm fails to disclose or suggest actual conversion of the data into spectral space (see Office Action, at page 4).

Therefore, Applicants submit that Flamm fails to disclose or suggest "transforming the measurement data into at least one spatial component in spectral space to identify a measured signature of said process, wherein said measured signature comprises the at least one spatial component in spectral space."

The Office Action relies on Gerrish to remedy this deficiency of Flamm with regard to Claim 1.

Gerrish is directed to an RF probe 22 for a plasma chamber, which samples the voltage and current of the applied RF power as it enters the input to the chamber. Gerrish describes computing the amplitudes and relative phase of the voltage and current baseband signals in a digital signal processor (see col. 3, lines 45-63). Voltage samples and current samples are processed as a complex waveform and the DSP performs a complex Fast Fourier Transform operation on the complex waveform. The DSP can then extract current and voltage spectra and the amplitudes, and relative phase of the voltage and current baseband signals can be obtained.

The Office Action appears to take the position that this description of Gerrish would make it obvious to convert the etch rate profile data of Flamm into spectral space "because spectral data analysis can be used for accurate control of plasma operations." (See Office Action, at page 4).

However, the etch rate profile data of Flamm characterizes a relative etch rate at different spatial coordinates of an etched film in the plasma chamber. It is not clear why one of ordinary skill in the art would take the teaching of Gerrish, which describes performing a Fourier transform ***on voltage and current waveforms from a voltage/current probe*** which is used for sampling the applied RF power, and then perform a Fourier transform on the etch rate profile data of Flamm. The Office Action's stated motivation of "because spectral data analysis can be used for accurate control of plasma operations" does not take into account that the data involved in Gerrish and Flamm are directed to completely separate aspects of a plasma processing chamber.

As stated in MPEP 2145.X.A:

> However, "[a]ny judgement on obviousness is in a sense necessarily a reconstruction based on hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made ***and***

> ***does not include knowledge gleaned only from applicant's disclosure***, such a reconstruction is proper." In re McLaughlin 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971). (Emphasis added).

MPEP §2142 states:

> The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in KSR International Co. v. Teleflex Inc., 550 U.S. 82 USPQ2d 1385, 1396 (2007) noted that **the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit**. The Federal Circuit has stated that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, **there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness**." In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). (Emphasis added).

In this case, Applicants respectfully submit that the Office Action has not shown a rational basis as to why one of ordinary skill in the art would make the asserted combination of Gerrish and Flamm to achieve the features of Claim 1 where Gerrish describes performing a Fourier transform on data which is completely different than the etch rate profile data of Flamm. Therefore, it appears that the Office Action is using impermissible hindsight analysis based on Applicants' disclosure to achieve all of the features of Claim 1.

In other words, without being aware of Applicants' disclosure, Applicants submit that one of ordinary skill in the art would not know to transform the etch rate profile data of Flamm into spectral data just by reading Gerrish. Gerrish does not teach such a general application of Fourier transforms to just any aspect of a plasma processing chamber.

Thus, Applicants respectfully submit that the rejection of Claim 1 under 35 U.S.C. §103(a), with Flamm as the primary reference, is improper and must be withdrawn.

Independent Claim 14 recites similar features as those of Claim 1. Therefore, Applicants respectfully submit that the rejection of Claim 14 under 35 U.S.C. §103(a), with Flamm as the primary reference, is improper and must be withdrawn.

With respect to the rejection of Claim 1 under 35 U.S.C. §103(a), with Farber as the primary reference, Farber discloses a method and apparatus for monitoring wafer characteristics based on a surface charge distribution pattern on the wafer. Farber discloses first obtaining an image of a surface charge distribution pattern of a wafer, and then comparing this image with a known surface charge distribution pattern correlated to desirable process results. As seen in Figures 1-4, the charge distribution pattern can include a particular configuration of lobes and rings which correlate to a problem in the performed process.

The Office Action acknowledges that Farber does not disclose or suggest actual conversion of the data into spectral space. The Office Action relies on Gerrish to remedy this deficiency of Farber with regard to Claim 1.

However, similar to the above discussion with regard to Flamm and Gerrish, the voltage and current data from an RF probe being analyzed in Gerrish is different than the surface charge distribution data being analyzed in Farber. Even if a "surface charge distribution pattern" is related to a current value in general, the actual analysis of voltage and current data from a RF probe in Gerrish, in its application and purpose, is different than the analysis of surface charge distribution data in Farber. Applicants submit that the Office Action has not shown any rational basis as to why one of ordinary skill in the art would learn from Gerrish to apply a Fourier transform to the surface charge distribution data of Farber.

Thus, Applicants respectfully submit that the rejection of Claim 1 under 35 U.S.C. §103(a), with Farber as the primary reference, is improper and must be withdrawn.

Independent Claim 14 recites similar features as those of Claim 1. Therefore, Applicants respectfully submit that the rejection of Claim 14 under 35 U.S.C. §103(a), with Farber as the primary reference, is improper and must be withdrawn.

In other words, the Office Action appears to take the position that Gerrish teaches applying a Fourier transform ***to any type of data within a plasma processing chamber***, which then allows for the asserted combination of Gerrish with either Flamm or Farber to achieve all the features of Claims 1 and 14. However, Gerrish only teaches applying a Fourier transform ***to a specific type of data*** in a plasma processing chamber, which is clearly different than the type of data being analyzed in Flamm or Farber.

Therefore, Applicants respectfully submit that Claims 1 and 14 (and all associated dependent claims) patentably distinguish over Flamm, Farber, and Gerrish, either alone or in proper combination, for all of the reasons discussed above.

Angell and Scott have been considered but fail to remedy the deficiencies of Flamm, Farber, and Gerrish with regard to Claims 1 and 14. Therefore, Applicants respectfully submit that Claims 1 and 14 (and all associated dependent claims) patentably distinguish over Flamm, Farber, Gerrish, Angell, and Scott, either alone or in proper combination.

With respect to the rejection of Claims 23 and 24 under 35 U.S.C. §103(a), Applicants respectfully traverse this ground of rejection. Claim 23 (and similarly Claim 24) recites "identifying whether a process variation is global or local based on the signature of spatial components."

In rejecting Claims 23 and 24, as obvious in view of the combination of Flamm and Gerrish, the Office Action states the following on page 7:

> "both Flamm and Gerrish are directed towards a method and apparatus for measuring data within a plasma chamber, analyzing the data, and providing feedback to control the given process. Flamm discloses the control of RF power and pressure and temperature (as discussed

> above, figure 5). Each of these variables measured and controlled is inherently either global or local [temperature is a local variable, pressure is a global variable, etc.]"

Applicants note that the Office Action makes a similar statement on page 11 with regard to Claims 23 and 24 being obvious in view of the combination of Farber and Gerrish.

However, the Office Action has only attempted to show that in Flamm and Farber, the variables being measured or controlled are either global or local variables. However, the Office Action has not addressed the features of Claims 23 and 24, and has not actually shown that either the combination of Flamm and Gerrish, or Farber and Gerrish, disclose or suggest "***identifying*** whether a process variation is global or local ***based on the signature of spatial components***."

Additionally, even though Gerrish describes performing a Fourier transform on voltage and current waveform data, Gerrish also does not disclose or suggest "identifying whether a process variation is global or local based on the signature of spatial components."

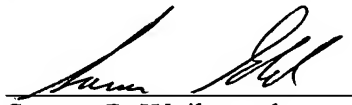
Therefore, Applicants submit that Claims 23 and 24 patentably distinguish over Flamm, Farber, and Gerrish, either alone or in proper combination.

Angell and Scott have been considered but fail to remedy the deficiencies of Flamm, Farber, and Gerrish with regard to Claims 23 and 24. Therefore, Applicants respectfully submit that Claims 23 and 24 patentably distinguish over Flamm, Farber, Gerrish, Angell, and Scott, either alone or in proper combination, for at least the foregoing reasons.

Consequently, in light of the above discussion, the outstanding grounds for rejection are believed to have been overcome. The present application is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Steven P. Weihrouch
Attorney of Record
Registration No. 32,829

Sameer Gokhale
Registration No. 62,618

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/07)